

Everything You Always Wanted to Know About Cone Beam Computed Tomography: 3D-Roentgen.ch

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Cone Beam Computed Tomography (CBCT; in German “Digitale Volumentomographie”; digital volume tomography) has become a standard tool in ear, nose, and throat (ENT) [1], maxillofacial [2], and dental X-ray in recent years [3]. Although its merits and potential are sometimes overestimated [4, 5], radiology departments increasingly add such a device to their equipment pool to satisfy their clientele’s demands.

The website that I present in this issue is based in Switzerland; the text is in German only (Fig. 1), but the tabular overviews should be understandable for the English speaking readers as well.

The site is run by a company that specializes in IT tools and equipment for dental surgery; the information is an independent collection of information gathered from the various manufacturers.

“3D-Roentgen” lists technical data (Fig. 2) for all CBCT machines currently available in Switzerland. Furthermore, the data sheets/brochures for all these systems are available by direct links to the manufacturers’ websites.

I was positively astonished to see that, although the site is maintained by a commercial company, it is completely free of any advertising. “3D-Roentgen” provides the data but does neither display banners or any other kind of advertising nor does it give recommendations for specific devices.

Therefore, I can recommend this site as a good overview if you are interested in getting a CBCT machine for your practice or clinical department.

References

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All screenshots are from www.3d-roentgen.ch (taken in June 2013).

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Fig. 1 Digital volume tomography website



In der Schweiz angebotene Digitale Volumentomographen (sortiert nach FOV)						
<ul style="list-style-type: none"> • Klick auf Typ = Prospekt • Klick auf das Mass des Mindestraumbedarfs = gerätespezifische Massskizze • Klick auf Detektor = Informationen zur entsprechenden Detektortechnologie • Die Dosiswerte entsprechen nicht einem standardisierten, vergleichbaren Messwert. Die angegebenen Dosiswerte ermöglichen daher keinen sicheren Vergleich zwischen den Anlagentypen • Alle Daten beruhen auf Angaben der Hersteller oder deren Schweizer Vertretung 						
DVT Features-Übersicht						
	Carestream 9000 3D	Vatech Pax Uni 3D	Planmeca Promax 3Ds	Kavo Pan eXam Plus	Soredex Cranex 3D	Sirona Orthophos XG 3D
Hersteller	Kodak (Trophy, F)	VATECH Co, Ltd & E-Woo, Südkorea	Planmeca, Fi	PaloDex Group Oy, Fi	Soredex Oy, Fi	Sirona, D
Richtpreis	€ 54'999.-	ab € 74'900.-	ab € 81'217.-	ab € 85'000.-	ab € 70'550.-	ab € 88'900.-
Mindestraumbedarf (TxBoxH)	1,7 x 1,5 x 2,25 m	1,6 x 1,2 x 2,35 m	1,5 x 1,63 x 2,43 m	1,5 x 1,1 x 2,05 (2,45) m	1,5 x 1,1 x 2,15 (2,45) m	1,5 x 1,2 x 2,25 m
Patientenpositionierung	sitzend / stehend	sitzend / stehend	sitzend / stehend	sitzend / stehend	sitzend / stehend	sitzend / stehend
Detektor	CMOS Flatpanel	CMOS Flatpanel	Amorpher Silizium Flachdetektor	CMOS Flatpanel	CMOS Flatpanel	CMOS Flatpanel
Aufnahmefeld (FOV(d x h))	5 x 3,7 cm Stiching: 7,5 x 3,7 cm*	5 x 5 cm (8 x 5 cm)* (12 x 8,5 cm)*	5 x 5 cm 8 x 5 cm Stiching: 10 x 11 cm	4,1 x 6,1 cm 7,8 x 6,1 cm	4,1 x 6,1 cm Optional: 7,8 x 6,1 cm	5 x 5,5 cm 8 x 8 cm
Auflösung	0,076 mm Stiching: 0,2 mm	0,186 mm	0,1 bzw. 0,2 mm	0,133 bzw. 0,25 mm	0,133 bzw. 0,2 mm	0,1 bzw. 0,16 mm
Aufnahmezeit	14 Sec	8,3 - 20 Sec	18 Sec	10 - 20 Sec	10 - 20 Sec	14 Sec
Rekonstruktionsdauer	< 40 Sec	< 40 Sec	30 - 150 Sec	1 - 3 Min	< 120 Sec	< 2 Min
Patientendosis (Herstellerangaben)	11 - 19 µSv Stiching: 31,3 µSv	ca. 30 µSv	18 - < 200 µSv	39 - 126 µSv		ICRP 2007: 43-175 µSv (Standard: 100 µSv)
Röhrenspannung (kV)	60-90	40 - 90	54 - 84	57 - 90	57 - 90	60 - 90
Röhrenstrom (mA)	2 - 15	2 - 10	1 - 16	4 - 16	4 - 16	3 - 16
Brennfleck (mm)	0,5 x 0,5	0,35 x 0,5	0,5 x 0,5	0,5 x 0,5	0,5 x 0,5	0,5 x 0,5
Rotationswinkel	360°	220°	200°	2 x 180° asymmetrisch		
Anzahl Projektionen während des Umlaufs	360	min. 440 / max. 715	300	234 / 466 / 608 / 1260	234 / 466 / 608 / 1260	200 / 500

Fig. 2 Features of cone beam computed tomography machines currently available in Switzerland